

Well Abandonment - Water

It is not uncommon to see an older farmstead or other residence with a hand pump or a dug well covered over with rotting boards. These types of situations are a threat to human safety as well as potential sources of ground water contamination. The water well drilling law requires that these abandoned wells must now be sealed with either a threaded or welded cap over the casing or by filling the well casing with impermeable material. The procedure for well abandonment is very specific and should not be attempted without consulting the Division of Operations Support for complete instructions. In addition, the **DNR, Division of Water, shall be notified in writing of abandonment within thirty days after plugging is completed.**

The Landowner Responsibility for Abandonment and Plugging of Wells rule defines the term "water well driller" as "a person who operates well drilling or driving equipment or engages in the drilling or driving of wells". It further defines "well" as "a hole drilled or driven to:

1. obtain geologic information on aquifers;
2. monitor the quality or quantity of ground water;
3. obtain ground water; or
4. utilize the geothermal properties of earth formations.

312 IAC 13-10-1 Temporary Abandonment of Wells

A well which has not been used for more than three (3) months without being permanently abandoned must be sealed at or above the ground surface by a welded, threaded, or mechanically attached watertight cap. The well shall be maintained so that the well does not become a source or channel of ground water contamination.

312 IAC 13-10-2 Permanent Abandonment of Wells

(a) A well abandoned before January 1, 1988, must be sealed at or above the ground surface by a welded, threaded, or mechanically attached watertight cap. The well shall be maintained so the well does not become a source or channel of ground water contamination. A well that poses a hazard to human health must also be plugged under subsection (c). A cased or uncased bucket well or a hand dug well (other than buried slab construction) that was abandoned before January 1, 1988, shall be closed in conformance with one (1) of the following procedures:

- (1) Covered with a reinforced concrete slab at least four (4) inches thick and having a diameter larger than the nominal diameter of the borehole or the well casing.
- (2) Equipped with a properly reinforced cover constructed of pressure treated lumber, using chromium copper arsenic salt, that has dimensions larger than the nominal diameter of the borehole or well casing. The cover shall be protected against the water with roofing or other water repelling materials that are properly maintained to ensure the integrity of the cover. Closure shall not be performed under this subdivision, however, if the cover is in direct contact with ground water or surface water.
- (3) Closed as otherwise approved by the division.

- (b) A well drilled before January 1, 1988, and abandoned before January 1, 1994, shall be sealed at or above the ground surface by a welded, threaded, or mechanically attached watertight cap. The well shall be maintained so the well does not become a source or channel of ground water contamination. A well that poses a hazard to human health must also be plugged under subsection (c).
- (c) A well abandoned after December 31, 1987, shall be plugged with an impervious grouting material to prevent the migration of materials or fluids in the well and the loss of pressure in a confined aquifer.
- (d) A well drilled after December 31, 1987, and not equipped with casing must be plugged within seventy-two (72) hours after completion.
- (e) This subsection applies as follows to a cased or uncased well abandoned after December 31, 1987:
- (1) The plugging material must consist of one (1) or a combination of the following:
 - (A) Neat cement with not more than five percent (5%) by weight of bentonite additive.
 - (B) Bentonite slurry (which can include polymers designed to retard swelling).
 - (C) Pelletized, medium grade, or coarse grade crushed bentonite.
 - (D) Other materials approved by the commission.
 - (2) The following methods apply:
 - (A) Cement and bentonite slurries shall be pumped into place in a continuous operation with a grout pipe introducing the plugging material at the bottom of the well and moving the pipe progressively upward as the well is filled.
 - (B) Plugging materials other than neat cement or bentonite slurry shall be installed in a manner to prevent bridging of the well or borehole. The well or borehole shall be measured periodically throughout the plugging process to ensure that bridging does not occur.
 - (3) The following procedures apply:
 - (A) An abandoned well shall be disconnected from the water system. Any substance that may interfere with plugging shall be removed, if practicable.
 - (B) A well (other than a monitoring well, a dewatering well, or an uncased borehole) shall be chlorinated before abandonment as provided in 312 IAC 13-9-1.
 - (4) A cased well shall be plugged as follows:
 - (A) With neat cement, bentonite slurry, or medium grade or coarse grade crushed or pelletized bentonite from the bottom of the well to within two (2) feet below the ground surface unless otherwise provided by the department.
 - (B) The well casing shall be severed at least two (2) feet below the ground surface, and a cement plug larger in diameter than the borehole shall be constructed over the borehole and covered with natural clay material to the ground surface.
 - (5) An uncased well (other than a borehole drilled by a bucket rig or a dewatering well governed by subdivision (8) or (9)), shall be filled with natural clay materials, neat cement, bentonite slurry, or medium grade or coarse grade crushed or pelletized bentonite from the bottom of the borehole to a depth of no less than twenty-five (25) feet below ground surface. The borehole shall be filled with neat cement or medium grade or coarse grade crushed or pelletized bentonite from a depth no less than twenty-five (25) feet

below ground surface to within two (2) feet below ground surface. The remaining borehole shall be filled with natural clay material to ground surface.

(6) A cased or uncased monitoring well shall be plugged from the bottom of the well or borehole to the ground surface with a bentonite slurry or pelletized or coarse grade crushed bentonite.

(7) A bucket well shall be plugged as follows:

(A) A bucket well installed as buried slab construction shall be filled with gravel from the bottom of the well to within ten (10) feet below the ground surface. Neat cement, bentonite slurry, or pelletized, medium grade, or coarse grade crushed bentonite shall be installed in the casing or well pipe from no less than ten (10) feet below the ground surface to within two (2) feet below the ground surface. The well pipe shall be severed at least two (2) feet below the ground surface and covered with a cement plug larger in diameter than the well pipe. The remaining hole shall be filled with natural clay material to the ground surface.

(B) Bucket well construction using casing with an inside diameter of less than twelve (12) inches extending the entire length of the borehole and equipped with a well screen shall be abandoned under subdivision (4)(A).

(C) An uncased borehole drilled by a bucket rig shall be filled with natural clay material from the bottom of the hole to the ground surface. The clay material shall be thoroughly tamped to minimize settling.

(D) For other than buried slab construction, a bucket well shall be filled with gravel from the bottom of the well to at least five (5) feet below ground surface. The top section of the concrete or tile well casing shall be removed to cause the top of the well to terminate below ground surface. The well shall be filled with at least one (1) foot of neat cement, bentonite slurry, or pelletized, medium grade, or coarse grade crushed bentonite from at least five (5) feet below ground surface to the top of the well casing. The well casing shall be covered with a cement plug larger in diameter than the borehole. The remaining hole shall be filled with natural clay material to ground surface.

(8) If a dewatering well casing is removed following use, the remaining borehole shall initially be filled with granular, pelletized, medium grade, or coarse grade crushed bentonite a minimum of one (1) foot thick. The remainder of the borehole shall be filled with natural earth materials obtained during the drilling process to the ground surface and be thoroughly tamped to minimize settling.

(9) If a dewatering well casing is removed following use and the well site will be excavated as part of the construction project, the remaining borehole shall be filled with natural earth materials obtained during the drilling process to the ground surface and be thoroughly tamped to minimize settling.

(f) The division shall be notified in writing of a well abandonment within thirty (30) days after plugging is completed.

312 IAC 13-9-1 Disinfection Procedures for Drilled Wells

(a) Except as provided in subsection (d), the following procedures shall be used for the disinfection of drilled wells:

- (1) The amount of water in the well shall be determined by multiplying the gallons per foot by the number of feet of water in the well according to the following table:

Diameter of Well in Inches	Gallons Per Foot
2	.16
3	.37
4	.65
5	1.00
6	1.50
8	2.60
10	4.10
12	6.00

(2) At least one hundred (100) parts per million of chlorine concentration in water are required for disinfection. For each one hundred (100) gallons of water in the well, the amount of chlorine liquid or compound shown in the following table shall be used:

Laundry Bleach	Hypochlorite Granules
(5.25% chlorine)	(70% chlorine)
3 cups	2 ounces

(3) The solution prepared under subdivision (2) shall be poured into the well to ensure the casing walls are wetted before the cover, cap, or seal is installed.

(4) Instead of the applications described in subdivisions (1) through (2), another application of chlorine may be substituted by a water well driller which results in a chlorine concentration of at least one hundred (100) parts per million.

(b) As used in this section, one (1) cup is equivalent to an eight (8) ounce measuring cup.

(c) As used in this section, one (1) ounce is equivalent to one (1) heaping tablespoon of granules.

(d) This section does not apply to a monitoring well or a dewatering well.

312 IAC 13-9-2 Disinfection Procedures For Bucket Wells

The following procedures shall be used for the disinfection of bucket wells:

- (1) The amount of disinfectant required is determined primarily by the amount of water in the well. The following table establishes the amount of chlorine to use for each foot of water in the well:

Diameter of well (ft)	3	4	5	6	7	8	10
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Amount of 5.25% laundry bleach to use per foot of water (in cups)	1.5	3	4.5	6	9	12	18
Amount of 70% hypochlorite (in cups)	1	2	3	4	6	8	12

- (2) To determine the amount of bleach, multiply the amount of disinfectant indicated as determined by the diameter of the well times the number of feet of water in the well.
- (3) The amount of bleach determined under subdivision (2) shall be added to approximately ten (10) gallons of water and splashed around the lining or wall of the well. The entire amount of disinfectant must be circulated so that the solution contacts all parts of the well.
- (4) The top of the well must be sealed.
- (5) Instead of the applications described in this section, another application of chlorine may be substituted which results in a chlorine concentration of one hundred (100) parts per million.